



**[6450-01-P]**

**DEPARTMENT OF ENERGY**

**Office of Energy Efficiency and Renewable Energy**

**[Case No. DW-007]**

**Notice of Petition for Waiver of BSH Corporation from the Department of Energy  
Residential Dishwasher Test Procedure, and Grant of Interim Waiver**

**AGENCY:** Office of Energy Efficiency and Renewable Energy, Department of Energy.

**ACTION:** Notice of petition for waiver, notice of grant of interim waiver, and request for comments.

**SUMMARY:** This notice announces receipt of and publishes the BSH Corporation (BSH) petition for waiver (hereafter, “petition”) from specified portions of the U.S. Department of Energy (DOE) test procedure for determining the energy consumption of dishwashers. Today’s notice also grants an interim waiver of the dishwasher test procedure. Through this notice, DOE also solicits comments with respect to the BSH petition.

**DATES:** DOE will accept comments, data, and information with respect to the BSH petition until **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

**ADDRESSES:** You may submit comments, identified by case number DW-007, by any of the following methods:

- Federal eRulemaking Portal: <http://www.regulations.gov>. Follow the instructions for submitting comments.
- E-mail: [AS\\_Waiver\\_Requests@ee.doe.gov](mailto:AS_Waiver_Requests@ee.doe.gov). Include “Case No. DW-007” in the subject line of the message.
- Mail: Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Program, Mailstop EE-2J, Petition for Waiver Case No. DW-007, 1000 Independence Avenue, SW, Washington, DC 20585-0121. Telephone: (202) 586-2945. Please submit one signed original paper copy.
- Hand Delivery/Courier: Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Program, 950 L’Enfant Plaza SW, Suite 600, Washington, DC 20024. Please submit one signed original paper copy.

Docket: For access to the docket to review the background documents relevant to this matter, you may visit the U.S. Department of Energy, 950 L’Enfant Plaza SW, Washington, DC, 20024; (202) 586-2945, between 9:00 a.m. and 4:00 p.m., Monday through Friday, except Federal holidays. Available documents include the following items: (1) this notice; (2) public comments received; (3) the petition for waiver and application for interim waiver; and (4) prior DOE waivers and rulemakings regarding similar dishwasher products. Please call Ms. Brenda Edwards at the above telephone number for additional information.

**FOR FURTHER INFORMATION CONTACT:** Mr. Bryan Berringer, U.S. Department of Energy, Building Technologies Program, Mail Stop EE-2J, Forrestal Building, 1000 Independence Avenue, SW, Washington, DC 20585-0121. Telephone: (202) 586-0371. E-mail: [Bryan.Berringer@ee.doe.gov](mailto:Bryan.Berringer@ee.doe.gov).

Ms. Elizabeth Kohl, U.S. Department of Energy, Office of the General Counsel, Mail Stop GC-71, Forrestal Building, 1000 Independence Avenue, SW, Washington, DC 20585-0103. Telephone: (202) 586-7796. E-mail: [Elizabeth.Kohl@hq.doe.gov](mailto:Elizabeth.Kohl@hq.doe.gov).

## **SUPPLEMENTARY INFORMATION:**

### **I. Background and Authority**

Title III, Part B of the Energy Policy and Conservation Act of 1975 (EPCA), Pub. L. 94-163 (42 U.S.C. 6291-6309, as codified) established the Energy Conservation Program for Consumer Products Other Than Automobiles, a program covering most major household appliances, which includes dishwashers.<sup>1</sup> Part B includes definitions, test procedures, labeling provisions, energy conservation standards, and the authority to require information and reports from manufacturers. Further, Part B authorizes the Secretary of Energy to prescribe test procedures that are reasonably designed to produce results which measure energy efficiency, energy use, or estimated operating costs, and that are not unduly burdensome to conduct. (42 U.S.C. 6293(b)(3)) The test procedure for dishwashers is contained in 10 CFR part 430, subpart B, appendix C.

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<sup>1</sup> For editorial reasons, upon codification in the U.S. Code, Part B was re-designated Part A.

The regulations set forth in 10 CFR 430.27 contain provisions that enable a person to seek a waiver from the test procedure requirements for covered consumer products. A waiver will be granted by the Assistant Secretary for Energy Efficiency and Renewable Energy (the Assistant Secretary) if it is determined that the basic model for which the petition for waiver was submitted contains one or more design characteristics that prevents testing of the basic model according to the prescribed test procedures, or if the prescribed test procedures may evaluate the basic model in a manner so unrepresentative of its true energy consumption characteristics as to provide materially inaccurate comparative data. 10 CFR 430.27(l). Petitioners must include in their petition any alternate test procedures known to the petitioner to evaluate the basic model in a manner representative of its energy consumption. The Assistant Secretary may grant the waiver subject to conditions, including adherence to alternate test procedures. 10 CFR 430.27(l). Waivers remain in effect pursuant to the provisions of 10 CFR 430.27(m).

The waiver process also allows the Assistant Secretary to grant an interim waiver from test procedure requirements to manufacturers that have petitioned DOE for a waiver of such prescribed test procedures. 10 CFR 430.27(a)(2) An interim waiver remains in effect for 180 days or until DOE issues its determination on the petition for waiver, whichever is sooner. DOE may extend an interim waiver for an additional 180 days. 10 CFR 430.27(h)

## **II. Application for Interim Waiver and Petition for Waiver**

On December 7, 2011, BSH submitted the instant petition for waiver from the test procedure applicable to dishwashers set forth in 10 CFR part 430, subpart B, appendix C. In every respect except the introduction of new model numbers, the instant petition is identical to one submitted by BSH on February 4, 2011. The February 4 petition was granted on June 29, 2011 (76 FR 38144). BSH states that “hard” water can reduce customer satisfaction with dishwasher performance resulting in increased pre-rinsing and/or hand washing as well as increased detergent and rinse agent usage. According to BSH, a dishwasher equipped with a water softener will minimize pre-rinsing and rewashing, and consumers will have less reason to periodically run their dishwasher through a clean-up cycle.

BSH also states that the amount of water consumed by the regeneration operation of a water softener in a dishwasher is very small, but that it varies significantly depending on the adjustment of the softener. The regeneration operation takes place infrequently, and the frequency is related to the level of water hardness. BSH included test results and calculations showing water and energy use very similar to that supplied by Whirlpool in its petition for waiver, which was granted by DOE. (75 FR 62127, Oct. 7, 2010). BSH states that the water used in the regeneration process is for the purpose of softening water rather than cleaning dishes. Therefore, according to BSH, this water and energy should not be included in the energy usage figures for washing dishes. BSH suggests a similar approach as used in EN50242. EN 50242 does not include the water or energy used in the water softening process in the dishwasher energy consumption calculation.

BSH also requested an interim waiver for particular basic models with integrated water softeners. An interim waiver may be granted if it is determined that the applicant will experience economic hardship if the application for interim waiver is denied, if it appears likely that the petition for waiver will be granted, and/or the Assistant Secretary determines that it would be desirable for public policy reasons to grant immediate relief pending a determination of the petition for waiver. (10 CFR 430.27(g))

DOE determined that BSH's application for interim waiver does not provide sufficient market, equipment price, shipments, and other manufacturer impact information to permit DOE to evaluate the economic hardship BSH might experience absent a favorable determination on its application for interim waiver. DOE has determined, however, that it is likely BSH's petition will be granted, and that it is desirable for public policy reasons to grant BSH relief pending a determination on the petition. Based on the information provided by BSH and Whirlpool, DOE determined that the test results may provide materially inaccurate comparative data.

BSH provided the European Standard EN 50242, "Electric Dishwashers for Household Use – Methods for Measuring the Performance," as an alternate test procedure. This standard excludes water use due to softener regeneration from its water use efficiency measure. Use of EN 50242 would provide repeatable results, but would underestimate the energy and water use of these models. If water consumption of a regeneration operation were apportioned across all cycles of operation, manufacturers would need to make calculations regarding average water hardness and average water consumptions due to regeneration operations that are not currently provided for in the test procedure. In lieu of these calculations, constant values could be used to approximate the energy and water use due to softener regeneration. In its petition, BSH requests

that constant values of 47.6 gallons per year for water consumption and 8.0 kWh per year for energy consumption be used.

Based on these considerations, and the waivers granted to BSH and Whirlpool for similar models, it appears likely that the petition for waiver will be granted. DOE also believes that the energy efficiency of similar products should be tested and rated in the same manner. As a result, DOE grants BSH's application for interim waiver for the basic models of dishwashers specified in its petition for waiver, pursuant to 10 CFR 430.27(g). Therefore, *it is ordered that*:

The application for interim waiver filed by BSH is hereby granted for the specified BSH dishwasher basic models, subject to the specifications and conditions below.

BSH shall be required to test and rate the specified dishwasher products according to the alternate test procedure as set forth in section III, "Alternate Test Procedure."

The interim waiver applies to the following basic model groups:

Bosch brand:

- Basic Model - SHE7ER5#UC
  - SHE7ER5#UC
  - SHV7ER5#UC
  - SHX7ER5#UC
  - SGE63E1#UC
  - SHE9ER5#UC
  - SHV9ER5#UC
  - SHX9ER5#UC
  - SHE8ER5#UC
  - SHX8ER5#UC
- Basic Model - SPE5ES5#UC
  - SPE5ES5#UC
  - SPV5ES5#UC
  - SPX5ES5#

Thermador brand:

- Basic Model - DWHD650G##
  - DWHD650G##
  - DWHD651GFP
- Basic Model - DWHD640J##
  - DWHD640J##
- Basic Model- DWHD651J##
  - DWHD650J##
  - DWHD651J##

DOE makes decisions on waivers and interim waivers for only those models specifically set out in the petition, not future models that may be manufactured by the petitioner. BSH may submit a subsequent petition for waiver and request for grant of interim waiver, as appropriate, for additional models of clothes washers for which it seeks a waiver from the DOE test procedure. In addition, DOE notes that grant of an interim waiver or waiver does not release a petitioner from the certification requirements set forth at 10 CFR part 429.

### **III. Alternate Test Procedure**

EPCA requires that manufacturers use DOE test procedures to make representations about the energy consumption and energy consumption costs of products covered by the statute. (42 U.S.C. 6293(c)) Consistent representations are important for manufacturers to use in making representations about the energy efficiency of their products and to demonstrate compliance with applicable DOE energy conservation standards. Pursuant to its regulations applicable to waivers and interim waivers from applicable test procedures at 10 CFR 430.27. DOE will consider setting an alternate test procedure for BSH in a subsequent Decision and Order.



During the period of the interim waiver granted in this notice, BSH shall test its dishwasher basic models according to the existing DOE test procedure at 10 CFR 430, subpart B, appendix C with the modification set forth below.

Under appendix C, the water energy consumption,  $W$  or  $W_g$ , is calculated based on the water consumption as set forth in Sect. 4.3:

§4.3 *Water consumption.* Measure the water consumption,  $V$ , expressed as the number of gallons of water delivered to the machine during the entire test cycle, using a water meter as specified in section 3.3 of this Appendix.

Where the regeneration of the water softener depends on demand and water hardness, and does not take place on every cycle, BSH shall measure the water consumption of dishwashers having water softeners without including the water consumed by the dishwasher during softener regeneration. If a regeneration operation takes place within the test, the water consumed by the regeneration operation shall be disregarded when declaring water and energy consumption. Constant values of 47.6 gallons/year of water and 8 kWh/year of energy shall be added to the values measured by appendix C.

#### **IV. Summary and Request for Comments**

Through today's notice, DOE announces receipt of BSH's petition for waiver from certain parts of the test procedure that apply to dishwashers and grants an interim waiver. DOE

is publishing BSH's petition for waiver in its entirety. The petition contains no confidential information. The petition includes a suggested alternate test procedure which is to measure the water consumption of dishwashers having water softeners without including the water consumed by the dishwasher during softener regeneration.

DOE solicits comments from interested parties on all aspects of the petition. Pursuant to 10 CFR 430.27(b)(1)(iv), any person submitting written comments to DOE must also send a copy of such comments to the petitioner. The contact information for the petitioner is Mike Edwards, Senior Engineer, Performance and Consumption, BSH Home Appliances Corporation (FNbG), 100 Bosch Blvd., Building 102, New Bern, NC 28562-6924. All submissions received must include the agency name and case number for this proceeding.

Submit electronic comments in WordPerfect, Microsoft Word, Portable Document Format (PDF), or text (American Standard Code for Information Interchange (ASCII)) file format and avoid the use of special characters or any form of encryption. Wherever possible, include the electronic signature of the author. DOE does not accept telefacsimiles (faxes).

Issued in Washington, DC, on March 27, 2012.

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Kathleen B. Hogan  
Deputy Assistant Secretary for Energy Efficiency  
Energy Efficiency and Renewable Energy

December 07, 2011

The Honorable Catherine Zoi  
Assistant Secretary, Energy Efficiency and Renewable Energy  
U.S. Department of Energy  
Mail Station EE-10  
1000 Independence Avenue, SW  
Washington, DC 20585

Via e-mail ([cathy.zoi@ee.doe.gov](mailto:cathy.zoi@ee.doe.gov)) and overnight mail

**Re: Petition for Waiver and Application for Interim Waiver** concerning the measurement of water and energy used in the water softening regeneration process of Dishwasher having an Integrated Water Softener

Dear Assistant Secretary Zoi:

BSH Home Appliance Corporation ("BSH") hereby submits this Petition for Waiver and Application for Interim Waiver pursuant to 10 CFR 430.27, concerning the test procedure for measuring energy consumption of Dishwashers.

BSH is the manufacturer of household appliances bearing the brand names of Bosch, Thermador, and Gaggenau. Its appliances include dishwashers, washing machines, clothes dryers, refrigerator-freezers, ovens, and microwave ovens, and are sold worldwide, including in the United States. BSH's United States operations are headquartered in Irvine, California. BSH's appliances are produced in the United States and Germany.

10 CFR 430.27(a)(1) provides that any interested person may submit a petition to waive for a particular basic model any requirement of Section 430.23, or of any appendix to this subpart, upon grounds that the basic model contains one or more design characteristics which either prevent testing of the basic model according to the prescribed test procedures, or the prescribed test procedures may evaluate the basic model in a manner so unrepresentative of its true energy consumption characteristics, or water consumption characteristics as to provide materially inaccurate comparative data. Additionally, 10 CFR 430.27 (b)(2) allows any applicant of a Petition of Waiver to also request an Interim Waiver if it can be demonstrated the likely success of the Petition for Waiver, while addressing the economic hardship and/or competitive disadvantage that is likely to result absent a favorable determination on the Application for Interim Waiver.

This request for Waiver is directed to Dishwashers containing a built-in or integrated water softener, specifically addressing the energy and water used in the regeneration process of the integrated water softener. This request is identical to Waiver Case Number DW-005 previously granted to BSH Home Appliance Corporation with the only modification being to add additional model numbers. Further, the water softening technology used in these models is identical to the models that were previously approved.

Based on the reasoning indicated herein, BSH submits that the testing of Dishwashers equipped with a water softener under the current DOE test procedure may lead to information that could be considered misleading to consumers.

### *1. Identification of Basic Models.*

The Dishwasher models manufactured by BSH which contain an integrated water softener and were not included in Waiver case No. DW-005 is as follows:

Bosch brand:

- Basic Model – SHE7ER5#UC
  - SHE7ER5#UC
  - SHV7ER5#UC
  - SHX7ER5#UC
  - SGE63E1#UC
  - SHE9ER5#UC
  - SHV9ER5#UC
  - SHX9ER5#UC
  - SHE8ER5#UC
  - SHX8ER5#UC
- Basic Model – SPE5ES5#UC
  - SPE5ES5#UC
  - SPV5ES5#UC
  - SPX5ES5#UC

Thermador brand:

- Basic Model – DWHD650G##
  - DWHD650G##
  - DWHD651GFP
- Basic Model – DWHD640J##
  - DWHD640J##
- Basic Model – DWHD651J##
  - DWHD650J##
  - DWHD651J##

### *2. Background*

The design characteristic that is unique among the above listed models is an integrated water softener. The primary function of a water softener is to reduce the high mineral content of “hard” water. Hard water reduces the effectiveness of detergents leading to additional detergent usage. Hard water also causes increased water spots on dishware, resulting in the need to use more rinse aid to counterbalance this effect. “Hard” water can reduce customer satisfaction with Dishwasher performance resulting in increased pre-rinsing and/or hand washing as well as increased detergent and rinse agent usage.

The water softening process requires water usage for both the regeneration process and to flush the system. For purposes of this Waiver request, the term “regeneration” will include the water and energy used in both the flushing and regeneration process of the water softener. The water used in the regeneration process is in addition to the water used in the dish washing process. The water used in the regeneration process does not occur with each use of the Dishwasher. The frequency of the regeneration process is dependant upon an adjustable water softener setting that is controlled by the end user, and based on the home water hardness. Regeneration frequency will vary greatly depending upon the customer setting of the water softener. Data from the U.S. Geological Survey shows considerable variation in the water hardness within the U.S. and for many locations the use of a water softener is not necessary. Water hardness varies throughout the U.S. with the mean hardness of 217 mg/liter or 12.6 grains/gallon (based on information provided by the U.S. Geological Survey located at <http://water.usgs.gov/owq/hardness-alkalinity.html>).

## **Calculations**

### **Water Use**

- Based on the DOE Energy Test for Dishwashers, the BSH Dishwashers listed in this waiver with an internal water softener use an average of 6.65 liters of water per dish cleaning cycle.
- Based on an average U.S. water hardness of 12.6 grains/gallon, the internal BSH Dishwasher water softener system would be set on “4”.
- Based on a BSH Dishwasher internal water softening system setting of “4” and the dishwasher using 6.65 liters of water per run, the water regeneration process would occur every 6<sup>th</sup> cycle.
- When using the Dishwasher 215 times per year (per DOE test procedure), the regeneration process would occur 35.8 times (36).
- The internal BSH water softening system uses 4.97 liters (5.0) per regeneration cycle.
- Water usage calculation based on above data.
  - $36 \times 5 = 180$  liters per year (47.6 gallons) or .84 liters (.22 gallons) each time the dishwasher is used.

### **Energy Used in kWh**

- Formula  $W = V \times T \times K$ 
  - $V$  = Weighted Average Water Usage per DOE
  - $T$  = Nominal water heater temperature rise of 39° C
  - $K$  = Specific heat of water 0.00115
- Calculated Energy use –  $180 \times 39 \times .00115 = 8.0 \text{ kWh/yr}$

## Summary

- A Dishwasher built by BSH with an integrated water softener in a home with a 12.6 grain per gallon water hardness would be cycled through the water softening regeneration process approximately every 6 dish cleaning cycles. When the water used in the water softener regeneration process is apportioned evenly over all dishwasher runs, the amount of energy and water usage per cycle is very low. Based on the assumptions provided, BSH estimates the typical water used in the internal Dishwasher water softener regeneration process at .84 liters (.22 gallons) per use; furthermore, using about 8.0 kWh per year to heat this water in the home hot water heater.

**Note:** Contrary to current DOE direction, in BSH's opinion the water used in the Water Softening regeneration process has the separate and distinct purpose of softening water and we do not feel that this water and energy should be included in the energy usage figures for washing dishes. EN 50242 does not include the water or energy used in the water softening process in the dishwasher energy consumption calculation and BSH would suggest adopting a similar approach as used in EN50242 when the test procedure is updated.

### 3. *Requirements sought to be waived*

Dishwashers are subjected to test methods outlined in 10 CFR Part 430, Subpart B, App. C, Section 4.3, which specifies the method for the water energy calculation.

- To stay consistent with the recently approved Whirlpool waiver, BSH is requesting approval to estimate the water and energy used in the water softening process based on the design of the BSH Dishwasher and the calculations and assumptions outlined above.

### 4. *Grounds for Waiver and Interim Waiver*

10 CFR 430.27 (a) (1) provides that a Petition to waive a requirement of 430.23 may be submitted upon grounds that the basic model contains one or more design characteristics which either prevent testing of the basic model according to the prescribed test procedures, or the prescribed test procedures may evaluate the basic model in a manner so unrepresentative of its true energy

consumption characteristics as to provide materially inaccurate comparative data.

If a water softener regeneration process was to occur while running an energy test, the water usage would be overstated. In this case, the water energy usage would be unrepresentative of the product providing inaccurate data resulting in a competitive disadvantage to BSH.

Granting of an Interim Waiver in this case is justified since the prescribed test procedures would potentially evaluate the basic model in a manner so unrepresentative of its true energy consumption characteristics as to provide materially inaccurate comparative data. In addition, a similar Interim Waiver and Waiver has previously been granted to BSH.

*5. Manufacturers of Similar Products and Affected Manufacturers*

Web based research shows that at least two other manufacturers are currently selling dishwashers with an integrated water softener, Miele Inc. and Whirlpool Corporation (Waiver Granted).

Manufacturers selling dishwashers in the United States include AGA Marvel, Arcelik A.S., ASKO Appliances, Inc., Electrolux North America, Inc., Fagor America, Inc., Fisher & Paykel Appliances, GE Appliances and Lighting, Haier America, Indesit Company Sa, Kuppersbusch USA, LG Electronics USA, Miele, Inc., Samsung Electronics Co., Viking Range Corporation and Whirlpool Corporation.

BSH will notify all companies listed above (as well as AHAM), as required by the Department's rules, providing them with a copy of this Petition for Waiver and Interim Waiver.

*6. Conclusion*

BSH Home Appliances Corporation hereby requests approval of the Waiver petition and Interim Waiver. By granting said Waivers the Department of Energy will further ensure that water energy is measured in the same way by all Dishwasher Manufacturer's that have a integrated water softener. Further, BSH would request that these Waivers be in good standing until such time that the test procedure can be formally modified to account for integrated water softeners.

BSH Home Appliances certifies that all manufacturers of domestic Dishwashers as listed above have been notified by letter. Copies of these notifications are attached.

With Best Regards,  
Mike Edwards



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